

SECTION 22 61 19

MEDICAL AIR COMPRESSOR

PART 1 - GENERAL

1.01 RELATED WORK

- A. Section 22 60 00: Medical Piping and Pipeline Components
- B. Section 22 60 13: Medical Gases Startup and Certification Procedure
- C. Division 26: Electrical
  - 1. Under Division 26, provide line voltage wiring for vacuum pumps and air compressors.
  - 2. Under Division 22, provide local and remote wiring to alarm panels in accordance with NFPA 99 and TDSHS and/or AHJ. Provide conductors and raceways as specified in Division 26.

1.02 SUBMITTALS

- A. Submit product data for review.

1.03 CODE COMPLIANCE/QUALITY ASSURANCE

- A. Install in compliance with N.F.P.A. 99, as required and enforced by authority having jurisdiction.
- B. Comply with local, state and Federal Code applicable in this jurisdiction.
- C. Employ a competent qualified system mechanic/foreman who has satisfactorily completed at least five other similar installations, for this work.

1.04 COORDINATION

- A. Coordinate layout and location of package pumps and accessories systems for proper spaces and clearances.
  - B. Coordinate with other trades to assure timely installation and to avoid conflicts and interference.
- PART 2 - PRODUCTS

2.01 QUALIFICATION OF MANUFACTURER

- A. Medical Air Compressor
  - 1. Beacon Medaes
  - 2. Allied Health Products, Chemetron Division
  - 3. Amico
  - 4. Patton's Medical Products
- B. Manufacturer/supplier shall have had at least five (5) years experience in the manufacture of medical air compressors.

- C. Provide a service organization with staffing during working days common use parts etc., within the Houston Metro area.

2.02 MEDICAL AIR COMPRESSOR (Oil-Less Base Mount)

- A. The medical air system shall be of a single point connection base mounted design consisting of duplexed or triplex compressor modules, and a dryer/control module with air receiver. It shall be fully compliant with the latest edition of NFPA 99. The modules shall be attached as one unit with single point connections for the intake, discharge, and electrical.
- B. The compressor shall be a continuous duty rated "oil-less" type with permanently lubricated, sealed bearings. The design shall be single stage, air-cooled, reciprocating type with corrosion resistant reed type valves with stainless steel reeds. Both the compression rings and rider rings shall be made from a long life, fluororesin material designed for continuous duty operation. The crankshaft shall be constructed of a durable nodular graphite cast iron and fully supported on both ends by heavy duty ball bearings permanently lubricated and sealed. The crankcase shall be constructed of gray cast iron, not aluminum. Maximum heat dissipation shall be achieved through cast aluminum alloy cylinders treated for optimum corrosion and wear resistance. Cylinder sleeves shall not be required. Additionally, an insulated "heat cut" piston pin shall minimize heat transmission from the piston wall to the piston pin needle bearing. Each cylinder head must be equipped with a wired shutdown switch for high discharge air temperature. The connecting rod shall be of a one-piece design. The compressor shall be v-belt of a one-piece design. The compressor shall be v-belt driven through a combination flywheel/sheave and steel motor sheave with tapered bushing and protected by an OSHA approved totally enclosed belt guard. A sliding motor mounting base that is fully adjustable through twin adjusting screws shall achieve belt tensioning. The motor shall be a NEMA rated, open dripproof, 1800 RPM, with 1.15 service factor suitable for 208 or 230/460V electrical service. Each compressor shall have a piped intake manifold with one inline inlet air filter with isolation valve. The inlet filter housing shall be isolated from the intake manifold by a braided 304 stainless steel flex connector. Each compressor module shall be equipped with an integral air-cooled aftercooler designed for a maximum approach temperature of 12 degrees F complete with moisture separator and timed automatic solenoid drain valve. Each cylinder head shall be equipped with a wired high discharge air temperature shutdown switch. The compressor discharge line shall include a flex connector, safety relief valve, isolation valve and check valve. The discharge air piping shall be of ASTM B-819 copper tubing, brass, and/or stainless steel. The discharge flex connector shall be braided 304 stainless steel, brass, or bronze.
- C. The compressor and motor shall be fully isolated from the main compressor module base by means of a four point heavy duty, spring isolation system for a minimum of 95% isolation efficiency. Where required by local or state regulation, seismically restrained isolators shall be provided.
- D. The dryer/control module shall include a NEMA 12, U.L. labeled control system, duplexed desiccant drying system, duplexed final line filters, duplexed final line regulators, and combination dew point hygrometer/CO

- monitor. All of the above shall be factory piped and wired in accordance with NFPA 99 and include valving to allow complete air receiver bypass, and air sampling port. The vertical air receiver shall be ASME Coded, National Board Certified, rated for a minimum 150 psig design pressure and includes a liquid level gauge glass, safety relief valve, manual drain valve, and a timed automatic solenoid drain valve.
- E. Each desiccant dryer shall be individually sized for peak calculated demand and capable of producing a 10 degree F (-12 degrees C) pressure dew point. Dryer purge flow shall be minimized through an integral demand based purge saving control system. The inlet to each dryer shall include a mounted prefilter rated for 0.01 micron with automatic drain and element change indicator. Fully duplexed final line filters rated for 0.01 micron with element change indicators and duplexed final line regulators and duplexed safety relief valves shall be factory mounted and piped.
- F. The duplex/triplex mounted and wired control system shall be NEMA 12 and U.L. labeled. This control system shall provide automatic lead/lag sequencing with circuit breaker disconnects for each compressor with external operators, full voltage motor starters with overload protection, redundant 120V control circuit transformers, visual and audible reserve unit alarm with isolated contacts for remote alarm (Refer to Section 22 60 00 for signals to be provided at master alarm panels), hand-off-auto lighted selector switches, pressure gauge, and duplexed runtime hourmeters. Automatic alternation of both compressors with provisions for simultaneous operation if required, automatic activation of reserve unit if required, visual and audible alarm indication for high discharge air temperature shutdown with isolated contacts for remote alarm shall be included.
- G. The dryer shall incorporate a dew point hygrometer/CO monitor with integral chemical CO sensor that is mounted, pre-piped, wired and includes remote alarm contacts. The hygrometer sensor shall be a ceramic type. Aluminum oxide sensors are not acceptable. The system accuracy shall be a minimum of +/- 2 degrees F for dew point and +/- 2 PPM (at 10 PPM) for carbon monoxide. Dew point alarm shall be factory set at 39 degrees F (4 degrees C) per NFPA 99, and the CO alarm shall be factory set at 10 PPM. Both set points shall be field adjustable. High CO and high dew point conditions shall be indicated with visual and audible alarms.
- H. The warranty for each medical air compressor shall be thirty (30) months from start-up or thirty- six (36) months from shipment and shall not exceed 6000 hours of operation.
- I. The medical air system shall use copper piping and brass fittings on the discharge. Pipe shall be braised per NFPA 99 requirements.
- J. Other components shall be warranted for twelve (12) months from start-up or eighteen (18) months from date of shipment by manufacturer.
- K. The service of the units shall be performed by a factory-trained service representative.
- L. Air Purity:

1. Air complying, as a minimum, with Grade D, CGA pamphlet G-7.1 "commodity specification for air" and having a maximum dewpoint of -63 degrees F.
  2. Air supplied shall comply with the limiting characteristics of Table A-2-2 of NFPA 99. Oil- free and oil-less compressors shall be provided with high temperature shut-down switches. Activation of switch shall be monitored by local and remote alarms.
- M. The medical air compressor shall be equivalent to Beacon Medaes Model specified on drawings.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Coordinate location with air compressors with area shown on drawings.

END OF SECTION